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(54) **A method and its equipment for two-way interactive communication by television**

(57) As characterized by the provision of a number of data processing centres interconnected through a telephone network with interactive terminals available to the users so as to supply to these terminals information specific to each one of the data processing centres corresponding to the particular applications controlled by that centre, the said centre being able to receive signals proceeding from the user's interactive terminal through the telephone network thus establishing a two-way interactive relationship between the users and the data processing centres with the further option of an interrelationship of a functional nature between the data processing centres and the television transmission service.

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Description

This patent discloses a method and its corresponding equipment for two-way interactive communication using television, the method and the equipment having as object the interrelation between televiewers and data processing and control centres through the telephone network, receiving information on the television, normally from a commercial television transmitter to which may be sent optionally, information from the data processing and control centres.

Methods exist within the current state of the art for interrelation between a television transmitting station and the viewer by means' of suitably codified signals preferably by modulation but also using the vertical interval space forming signals in the area not detectable by the viewer without the use of a control means such as a monitoring device which receives the coded signal and transforms it to a signal which activates a piece of apparatus available to the viewer such as a toy automotive, educational matter or some other such device.

The object of this patent is a novel method of communication using televised signals which can establish an interrelation between the televiewer and control centres such that the former may participate on a two-way basis and actively in the programmes being shown on television, both as direct broadcasts and and prerecordings as well as those specifically for publicity such that by means of the data received through the television screen and converted to messages on the televiewer's visual monitor, the viewer is able to participate interactively by generating calls through the telephone exchange network, the Ibertex or other similar systems, to the system control centre and eventually with the television studio itself.

By this means the method, object of this patent, enables the user from his home and equipped with a remote control associated with a television receiver and also the telephone network instrument to have access to new forms of entertainment, education, commercial transactions and dealings etc. all based on the fundamental characteristic of a two-way interactive participation of the televiewer corresponding to the signals received through the television screen made visual to the viewer by means of the decoding apparatus and the visual display monitor.

Essentially two-way interactive method of communication which is the object of this patent comprises, on the one hand, emission of signals from the television studio through the television network to individual receivers broadcasting the normal direct or prerecorded programmes and specific publicity programmes including in those emissions previously codified signals carrying messages not visible directly to the viewer, being confined to one area of the screen but which are susceptible to being displayed visibly or being heard audibly by a receiver terminal or Complete Interactive Terminal (CIT), itself connected with its series of data processors each with its own function, through the telephone intercommunication systems, public, Ibertex or similar. This dual communication route using the receiver unit through the standard and the codified television reception and the connection with the aforementioned data process centres may be extended optionally to communication between the data processing centres and the television studios supplying data to the latter, depending on the type of function which the data processing centre wishes to carry out, Information so communicated will be coded such that the signals sent out on television will include the non-visible signals as required by each of the functions controlled by the centres.

Difficulties may arise in some geographical areas where reception is poor from the television and under these conditions it is possible that the normal television signal is adequate for viewing but the coded signal in certain specific instances may not be of sufficient quality to decipher the message emitted by the data processing centres for each function of the system.

To obviate this difficulty this patent provides for the signals originating at the data processing centres to be transmitted direct to the receiving unit or complete interactive terminal (CIT) by radio, that is as variable frequency signals which having direct access to the CIT equipment do not suffer from the deficiencies to which television is subject under certain circumstances or in certain areas.

Radio transmission can be by using a Frequency Modulation carrier wave of the RDS system.

In any case while the radio signals may be emitted by frequency modulation they will comply precisely to meet the real time synchronization with the television signals.

It is evident that the system may comprise both the use of codified television signals through the normal television channels and simultaneously the reception of radio signals and the complete interactive terminal (CIT) in this case will be able to receive and interpret both types of signals. Evidently as an option the radio reception may replace entirely the reception of information through the television.

It is clear from the above that the method herein disclosed provides a clear and real communication in an interactive two-way system such that the television viewer can participate directly and in real time in the programmes and announcements appearing on the television screen.

The numerous applications of the novel method and its associated equipment open new opportunities in the field of education, competitions, lotteries and commercial transactions as well as for electronic information of all types such as relating to stock issues and financial services and notices. To put this into effect it is simply necessary to programme the data processing centres, each with the specific function relevant to its purpose, codify the information for its introduction into the signal

transmitted by the television station so that it arrives in that form at the receiver and that the user, operating his individual control unit may participate in the operations to which he will have access under some form of contract: by the purchase of equipment, payment of rentals or other consideration for the service.

In the preferred form the interactive unit at the disposal of the user will be a complete interactive terminal, here designated the CIT, which can receive the televised coded programme or video programme so that the viewer watching the screen may participate on a two way basis in the system as a whole. The CIT unit is connected to the video output socket of the television receiver or to the video itself and to the telephone network as an accessory to the main telephone instrument. The CIT includes a microprocessor for controlling the terminal and its sub-systems, a display screen preferably of the vacuum gas-filled fluorescent tube type, a printer, preferable of the thermic type, a coded signal receiver and a Modem for communicating with the telephone network.

This patent is applicable equally to an interrelation to be established by the interactive terminal and codified videos instead of the television broadcast. Such video tapes could contain for example, in coded form, sales catalogues so that on deciding to purchase the user can access the data processing centre from his terminal, or interactive games where on attaining specific results the data centre can be informed so releasing prizes, or educational tapes with proof of evaluation, possibly to the extent of examination results, or other similar applications, all controlled through a specific data processing centre.

To assist the decription block diagrams are attached to this patent showing by way of a non restrictive example, schematic layout arrangements of the described method and its equipment.

Figure 1 shows the complete two-way interactive system in block diagram form.

Figure 2 also in block diagram form shows the complete interactive terminal.

As may be seen from the diagrams this novel method for two-way interactive communication comprises a series varying in number, such as 1...1N, of data processing centres in a circuit which can be closed through the various units forming the system consisting of the telephone exchange network -3- which in turn is connected to the complete interactive terminal -4- through the domestic phone instrument, not shown here. As stated previously the CIT unit receives the coded signal through the video output -5- of the television receiver -6- or from a video recorder tape, the said CIT unit having the necessary means to establish communication with the viewer, indicated in the diagram as -7- who has at his disposal an infrared remote control switch -8- enabling him to instruct the interactive unit in accordance with the functions required.

The television transmitter -9- is in circuit with the coding unit -10- thus receiving signals in code form which can then be broadcast with the television programmes on the usual network -11- being received by the domestic television set -6-. For some purposes the route for communication between the data processing centres 1....1N and the television transmitter -9- can be short circuited such that the centre may receive the responses direct from the televiewer in answer to messages sent as coded signals.

The complete interactive terminal -4- as shown in the figure 2 comprises a microprocessor -12- and a display screen -13- visible to the user with a connection=to a printer -14- preferably of the thermic type,to convey messages, figures and other information to the viewer in writing. The complete interactive terminal or CIT is provided with an infra red sensitive switch -15-for acceptance of commands from the remote control emitter -8- as well as a Modem -16-, interconnected with the domestic telephone instrument -17- and hence with the telephone line network -18-. A coded signal receiver -19-accepts the coded signals from the television receiver -6- which are then accessed to the microprocessor and form the base of the functions to be carried out as output of the complete interactive terminal. The CIT is powered from a suitable power pack -20- or batteries at low voltage being preferably in the 6 to 24 volt range.

The microprocessor -12- for preference is of 8 bits and of CMOS technology, with between 8 and 64K ROM memory and from 32 to 1024K RAM memory.

The screen -13- is preferably of the vaccuum gas discharge fluorescent type with between 8 and 80 characters on one or two lines of text, for display of the messages received by the terminal and within the vision of the user. The characters should be of a size that makes the information they portray legible at a minimum of 5 metres in any ambient luminosity level.

The remote control device -8- operates on the CIT unit by issueing commands by infra red with 10 numerical keys, two yes/no keys and from 6 to 24 function and service keys. For some applications such as games an alternative key layout plan can be superimposed to provide the viewer with a faster and simpler response.

The modem -16- in the CIT terminal will preferably be of type V 23 (1200,75 HALF DUPLEX) with automatic decadic multifrequency marking but without autoresponse. The CIT also is equipped with a DTMF tone generator for access to audiotex data banks. The audible information is delivered to the user by a built in loudspeaker -21-.

This patent provides also that some or all the components of the complete interactive terminal can be fitted into a television receiver or video unit. Thus the screen may not be required in the CIT as the messages can be displayed on the screen of the television receiver itself. Also the television remote control handset may be

used instead of the dedicated CIT remote control unit. Finally the entire CIT as a separate piece of equipment can be dispensed with by integrating all the components within the television receiver or the video which would have been specially designed to accomodate the interactive television system.

Furthermore the complete interactive terminal or CIT need not have a special printer but can be fitted with a standard commercially available printer using a standard output connection such as the RS-232 inter-face plug/socket system.

Equally the CIT need not have its own special display screen but can be provided with the standard video socket as for example a BNC connector for a monitor or external commercially available VDU.

The remote control handset can also be dispensed with and replaced by keyboard connected by cable or by radio to the terminal.

Other variations can be introduced within the scope of this patent among which can be the reduction of the CIT unit down to a PC card containing the codified signal receiver logic and with connections for television receivers or video recorders so that once the card is inserted in the Personal Computer with the relevant computer programming, the PC functions as an complete interactive terminal. Another variant of this type is to replace the PC insertable card by a CIT in the form of a unit consisting of the codified signal receiver logic, the connection means for the television receiver or video recorder, a power supply and an entry/exit connection as for example, a serial port, for a Personal Computer.

This patent also includes the possibility of communication between the user's complete interactive terminal and the data processing centres by means of radio using a specific allocated frequency instead of the telephone network or by cable or through the power line distribution system used as a transmission network equally in place of the telephone network.

The system described includes the access to the various data processing centres by the telephone public network, the Ibertex network but also includes access through other systems or by radio by the use of Modems other than the V23. For each application the relevant access reference will be made known at the terminal by software or by means of coded massages.

This new method will be of particular interest to television Comapnies as it offers the possibility of obtaining a response from viewers who are watching television programmmes or publicity and so providing a reliable ratings figure and hence lessening the phenomena known as "Zapping" and improving viewer fidelity.

The above characteristic can provide additionally an improved accountability to the advertisers and the television viewers are able to participate in many other forms of commercial activity and at the same time result in an improvement in audience data as compared to the actual methods, both as to number and category of viewer.

Television advertisers can obtain an increased efficiency in their campaign messages to actual and potential customers which can be accompanied by direct participation with messages tailored specifically to the selected clientele both for general promotion and for sales campaigns.

The above possibilities offer considerable advantages to publicity agencies, telephone operating Companies and distribution networks as well as providing an effective means for market research and for banking operations and other services.

Claims

1. A system for two-way interactive communication by television comprising:

   a TV transmitter (9),
   a TV receiver (6),
   a complete interactive terminal (CIT) (4),
   a number of data processing centres (1,1N) connected to the CIT (4) via an intercommunication system by means of radio on variable frequencies synchronized as to real time with the television signals and providing to said CIT (4) specific information in the form of non-visible signals, said information corresponding to the particular application controlled by the respective centre (1,1N),
   wherein the TV transmitter (9) transmits video signals to the TV receiver (6) the TV receiver (6) emits the video signals and ,the CIT (4) receives and processes the signals from the data processing centres (1,1N) into visible and/or audible information for the user (7),
   the CIT (4) further receives commands from the user (7) and forwards the commands to the data processing centres (1,1N) via the two-way telephone line.

2. A system for two-way interactive communication by television comprising:

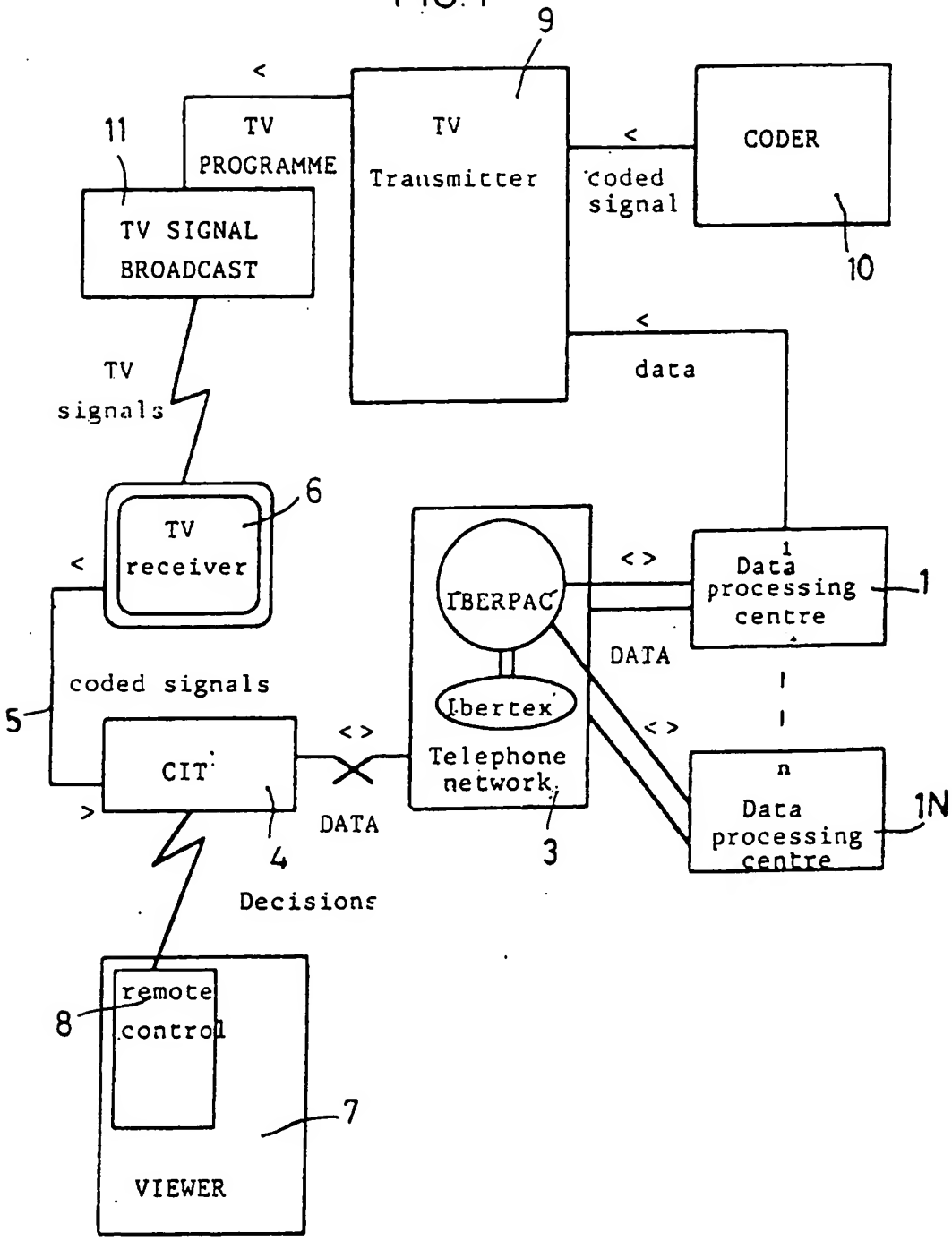
   a TV transmitter (9),
   a TV receiver (6),
   a complete interactive terminal (CIT) (4),
   a number of data processing centres (1,1N) connected to the CIT (4) via an intercommunication system by means of radio on variable frequencies synchronized as to real time with the television signals and providing to said CIT (4) specific information in the form of non-visible signals, said information corresponding to the particular application controlled by the respective centre (1,1N),
   wherein the TV transmitter (9) transmits video signals to the TV receiver (6) the TV receiver (6) emits the video signals and ,the CIT (4)

receives and processes the signals from the data processing centres (1,1N) into visible and/or audible information for the user (7),

the CIT (4) further receives commands from the user (7) and forwards the commands to the data processing centres (1,1N) via the intercommunication system.

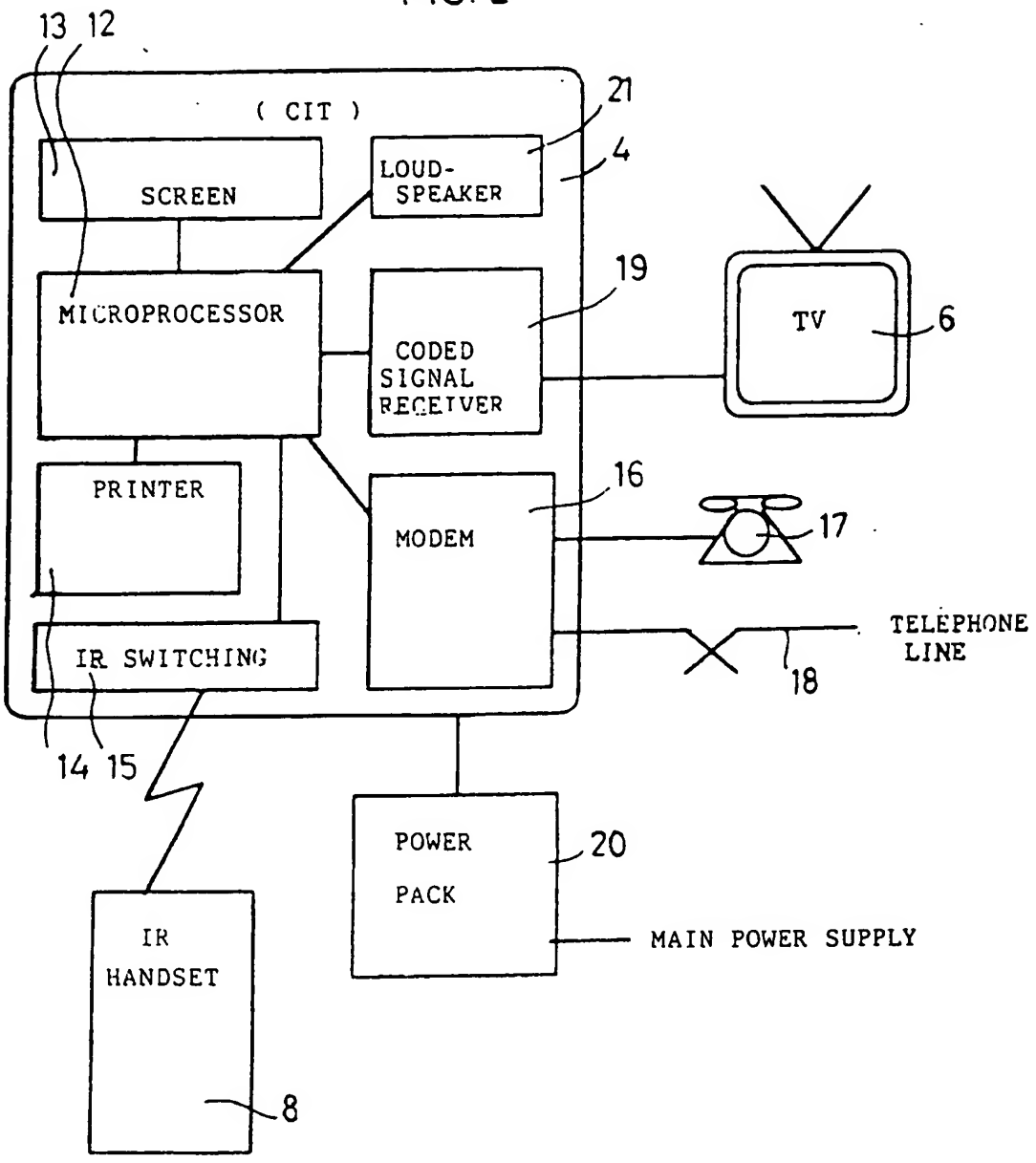
3. A method and its equipment for two-way interactive communication by television as in claim 1 or 2, in which the communication between the complete interactive terminals and the data processing centres is by means of radio on a specific network channel.

FIG. 1



BLOCK DIAGRAM OF THE INTERACTIVE TELEVISION SYSTEM

FIG. 2



BLOCK DIAGRAM OF THE UNIVERSAL INTERACTIVE UNIT